

## P4

### Magnetic resonance T1w/T2w ratio in the putamen and cerebellum as a marker of cognitive impairment in MSA: a longitudinal study

*Sofia Cuoco*<sup>1</sup>, S. Ponticorvo<sup>1</sup>, R. Bisogno<sup>1</sup>, R. Manara<sup>2</sup>, F. Esposito<sup>3</sup>, G. Di Salle<sup>4</sup>, F. Di Salle<sup>1</sup>, M. Amboni<sup>1</sup>, R. Erro<sup>1</sup>, M. Picillo<sup>1</sup>, P. Barone<sup>1</sup>, M.T. Pellecchia<sup>1</sup>

<sup>1</sup>Department of Medicine, Surgery and Dentistry “Scuola Medica Salernitana”, Neuroscience section, University of Salerno, Baronissi, Italy

<sup>2</sup>Neuroradiology Unit, Department of Neurosciences, University of Padua, Padua, Italy.

<sup>3</sup>Department of Advanced Medical and Surgical Sciences, University of Campania "Luigi Vanvitelli", Napoli, Italy.

<sup>4</sup>Scuola Superiore di Studi Universitari e Perfezionamento Sant'Anna, Classe di Scienze Sperimentali, Pisa, Italy

*Introduction:* The exact pathophysiology of cognitive impairment in multiple system atrophy (MSA) is unclear [1, 2]. In our longitudinal study we aimed to analyze: (I) the relationships between cognitive functions and some subcortical structures, such as putamen and cerebellum assessed by voxel-based morphometry (VBM) and T1-weighted/T2-weighted (T1w/T2w) ratio, and (II) the neuroimaging predictors of the progression of cognitive deficits.

*Methods:* Twenty-six patients with MSA underwent a comprehensive neuropsychological battery, motor examination and brain MRI at baseline (T<sub>0</sub>) and 1-year follow-up (T<sub>1</sub>). Patients were then divided according to cognitive status into MSA with normal cognition (MSA-NC) and MSA with mild cognitive impairment (MCI). At T<sub>1</sub> we divided the sample according to worsening/non worsening of cognitive status compared to baseline evaluation.

*Results:* Logistic regression analysis showed that age ( $\beta=-9.45$ ,  $p=.02$ ) and T1w/T2w value in the left putamen ( $\beta=230.64$ ,  $p=.01$ ) were significant predictors of global cognitive status at T<sub>0</sub>, explaining 65% of the variance. Logistic regression analysis showed that  $\Delta$ -values of WM density in the cerebellum/brainstem ( $\beta= 2188.70$ ,  $p=.02$ ) significantly predicted cognitive worsening at T<sub>1</sub>, explaining 64% of the variance.

*Discussion:* Our results suggest a role for the putamen and cerebellum in the cognitive changes of MSA, probably due to their connections with the cortex. The putaminal T1w/T2w ratio may deserve further studies as a marker of cognitive impairment in MSA [3].

#### References:

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